approach

FEBRUARY 1980 THE NAVAL AVIATION SAFETY REVIEW

COPPING OUT

By CAPT V. L. McMinn, USMC
Naval Safety Center

A FEW phrases that occasionally creep into mishap reporting are *operational necessity, operational requirement,* and *tempo of operations.* Related terms are *tactical combat environment* and *military exigency.* Just for a moment, let us examine these phrases and how they apply to aircraft mishap reporting.

The first two, *operational necessity* and *operational requirement,* have no application in mishap analysis, and usually indicate some sort of breakdown in the decision making process. When stating *operational necessity* or *requirement* and not fully explaining the circumstances or conditions that lead up to the mishap-related decision, no insight can be gained into the psychological pressures and climate at the moment of the decision. The decision-maker is implying that he was aware that a high-risk decision was made, and that he approved of taking that risk. Shortcutting established procedures falls into this category. The following is an extract from recent, accident-related message traffic:

> The conduct of operations which ignore or circumvent sound maintenance and operational practices cannot be permitted. In this period of resource austerity, each squadron commander must ensure that his unit operates to its maximum effectiveness within the constraints of the unit's available resources. There is no routine peacetime mission that takes precedence over prudent established maintenance and operational procedures.

The third term, *tempo of operations,* is a recognized mishap cause factor but is ordinarily reserved for use in areas of actual hostility. However, *tempo of operations* is sometimes used in the same context as *operational necessity* and *operational requirement*. In other words, it is used to justify a bad, peacetime, artificial-pressure decision.

The last two terms, *military exigency* and *tactical combat environment,* are for use in actual contingency or hostile operations, and not for the local commander's arbitrary decision. Here is another extract from recent message traffic.

> There is no flight in peacetime so important that it can't be cancelled or terminated . . . If there is a reasonable doubt that the flight cannot be conducted safely . . . get it on the ground.

When a decision has backfired and resulted in a mishap, it is important to recognize the decision as supervisory error, and to analyze the factors leading up to the decision just as if it were a material failure which caused the mishap. Not only the fact of failure, but the **why** is necessary if similar mishaps are to be avoided and lessons learned are to be applied to future operations. ◄

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This months's cover of an A-6 Intruder is courtesy of the Atlantic Fleet Audiovisual Command, NAS Norfolk, Virginia.

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Where do

By LCDR John C. Wells
Aircraft Accident Investigation Division
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you go from here?

"It is unwise, my dear Watson, to speculate in advance of the facts," Holmes admonished. "Invariably, it biases the judgment."

THE above quote inconspicuously adorns the office of the Aircraft Accident Investigation Division at the Naval Safety Center. Much more than a decoration, it serves as a succinct description of the function of that office and the small cadre of specially trained professionals who work there. The six Navy officers, one Marine officer, and one civilian who are "Special Aircraft Accident Investigators for the Chief of Naval Operations" approach their jobs just as Holmes prescribed – avoiding speculation, gathering facts through proven methodology, and reaching unbiased conclusions.

If you are a designated naval aviator, a naval flight officer, an aviation maintenance officer, or flight surgeon, chances are good that you will be appointed to a permanent Aircraft Mishap Board (AMB) during at least one of your aeronautically associated tours. The aviation safety officer of your unit can provide a wealth of details about the Board's duties. Fortunately, the chances are not as good that you will be called upon to perform these duties.

If you are an enlisted member of an aviation unit, you may be called upon to assist the AMB in an Aircraft Mishap Investigation. Maintenance technicians provide one of the primary sources of technical expertise during these investigations. Manpower for the wreckage salvage operation is drawn from all rates.

If your unit is unfortunate enough to require the services of the Board and its attendant enlisted experts, without intending to diminish the negative aspects of an aircraft mishap, you could be participating in the most interesting work in aviation safety – **aircraft accident investigation.**

More than one *typical* military training film portrays the *typical* AMB solving the *typical* aircraft mishap, as they deftly tick off the pages of their *Handbook for Aircraft Accident Investigation.* Although the filmed scenario covers several days of work, the approximate 30 minutes showing time might lull the viewer into a warm feeling that an accident investigation goes very quickly. What could be further from the truth?

Consider the following facts:

- There is no *typical* aircraft mishap (more accurately called a crash). It has been years, however, since anyone has found a really unique way to destroy a naval aircraft, so maybe we are looking at typical crashes.
- Not that many crash sites are accessible by normal ground transportation. Naval aviators appear to be a funny breed that have to show off in public; they seem to prefer the deepest oceans, the craggiest mountain peaks, and the most dismal swamps to perform the *final act.* The greater part of mishaps occur in areas remote from home base or any military facility; very few happen near any "good" liberty spots.

(left to right) LCDR John Wells, CDR Bill Broyles, CDR Jim Vreeland, LCDR Bruce Nelson, and Mr. John Combs of the Aircraft Accident Investigation Division, Naval Safety Center, analyze a failed compressor rotor disk.

Continued

- Naval aircraft mishaps almost always require a great deal more manpower than just the members of the AMB, as well as coordination with other services, government agencies, and civilian agencies. Confusion is the order of the day.
- The weather is not always as warm and sunny at the crash site as that seen in the *typical* military training film; hot, cold, wet, and tired will become very familiar.
- The *typical* AMB is not manned by professionals that are practiced in the methodology of accident investigation, but mostly young lieutenants and lieutenant commanders who have never seen a third-stage compressor blade, let alone antirotational blade curl, brinnelling, or instantaneous fracture zones.
- OPNAV instructions allow 14 days from mishap to completion of the Summary Message Report, which seems very ample; however, the board cannot dawdle to meet that deadline. In more complicated mishaps, i.e., total aircraft destruction, lengthy salvage operations and complex engineering investigations, 14 days are not enough and extensions must be requested. Some investigations take months to complete.

The first glimpse of a smoking hole – *the thousands of disjointed little scraps that used to be one of your sleek flying machines, mega-million dollar weapons system platform, "laughter – silvered wings"*[1] – causes a range of emotions, not the least of which are wonderment, amazement, numbness, and curiosity. After the initial shock, the "golly, gee whiz" feelings are replaced by the more somber emotions. You may feel a morose nausea when you realize that some of those unrecognizable scraps are the remains of human beings – perhaps a friend you joked with only hours before. You may be remorseful and self-incriminating about aircrew weaknesses you didn't mention or the gripe you forgot to write up the last time you flew this bird.

Fortunately, less than half of all mishaps involve loss of life. Hopefully, Mr. Board Member, you will be spared the more somber feelings, but it is doubtful that you can escape the third emotional gamut: hopelessness, helplessness, confusion, fear, and total frustration – "it worked in the training film, but it's not going to work here – **help!**"

The questions must be answered – "What caused this accident?" "How can we figure out what caused this accident?"

Obviously, the answer to the very popular question, "What happened?", is the fundamental reason for an investigation. However, the answer to the other question, asked just as often, "How can you ever tell what happened from all these little pieces?", provides the fundamental reason for having designated aircraft accident investigators.

LCDR Wells displays a destroyed set of turbine inlet guide vanes from a past mishap.

A complete mishap investigation involves the methodical completion of many interrelated procedural steps – checklists – ticking off the pages of the investigator's handbook.

An obvious early step, taking statements from surviving crewmembers and witnesses, can quickly put the investigation on the right track, or occasionally and just as quickly, on the wrong track. Pilots/crews can describe the malfunctions they saw and their responses. Witnesses can describe their observations of the aircraft prior to impact. Aircraft material failures leave evidence which is in the wreckage – a metal fatigue crack, a broken bolt, a missing nut or cotter pin, certain patterns of fire damage, etc. The evidence is there. But where? Without the guidance of witnesses, particularly crewmembers, where do you start? Perhaps you will be able to ask the Naval Safety Center investigator.

When the crew does not survive, Commander, Naval Safety Center usually launches an aircraft accident investigator to conduct a *concurrent* investigation and assist the AMB. Other investigations in which a Safety Center investigator can be expected to participate would involve multiple fatalities (not necessarily the crew), high public interest, new aircraft types (F-14, F-18, AV-8, S-3), and apparent emergence of an accident trend.

[1] John Gillespie Magee, Jr., *High Flight.*

Launching an investigator need not be a one-way decision. It must be emphasized that the investigators are also ready to help when requested by the convening authority, or the senior member of the AMB. If you have any reservations about a successful investigation, ask for help, but ask for help at the onset. The investigator wants to get there while the "hole is still smoking," not when the board has run out of ideas 2 days before the summary message is due out.

When the Safety Center sends an assisting investigator, the Board is notified by phone, if possible, and by naval message. It is a standard request from all the investigators that no wreckage be moved until they direct it. (OPNAVINST 3750.6L, para 402F, states that the investigator "will control all real evidence pertaining to the mishap until released to the Aircraft Mishap Board.") The importance of leaving the wreckage as it fell cannot be overstressed. Premature wreckage movements are categorized by three common mistakes: trying to put two broken pieces back together to see if they fit; turning pieces over to see what's on the other side; picking up pieces out of fear they cannot be found again. Each of these apparently harmless acts of assistance can readily destroy vital evidence.

Now, you compulsive wreckage movers take heart. All rules are made for exceptions, and the following situations are excluded from the hands-off wreckage policy (within reason, of course):

- Removal of crewmember/passenger remains usually requires some wreckage movement. However, minimum possible parts displacement, please. Also, ensure excessive photography of the area and accurate wreckage plots prior to any disturbance.
- Wreckage that presents an intolerable disruption of military or civil operations may require partial or complete removal, but again, maximum photography and accurate plots are essential.
- Securing classified equipment/material is often required, but don't forget to record those locations.
- There is also necessary wreckage movement in a water salvage, but that is beyond the scope of this article.

What is within the scope of this article is *urgency* versus *methodology*, or doing it quickly but doing it right. The malefactor expediency must fall out with the dust that settles after the crash, because some Board Members appear to be pervaded with a misguided desire to get the wreckage out of the field as quickly as possible. On the other extreme is the Board that is in no hurry at all. Fortunately, these are extremes and not often seen in an investigation. A sense of urgency must prevail, but the investigation must be done methodically, so that no evidence is overlooked. How is this dichotomy of purpose resolved? Simply stated, the answer is, "A maximum number of productive work hours, 7 days a week, until the investigation is completed."

The need for urgency in solving an accident should require no elaboration. However, it bears repeating that we cannot lose sight of the basic objective – to find the cause and prevent a similar mishap.

The **proven methodology** of an investigation does require elaboration. Based on the lessons learned about the *average* ground impact type crash with no survivors, the investigation will probably conform to the following scenario.

An aircraft is reported overdue, or a crash is witnessed and reported. Scott AFB coordinates a search for the wreckage and survivors until their locations are known. Initial required reports are formatted and transmitted. The Aircraft Mishap Board is assembled and begins to organize the investigation, which includes impoundment of all records pertinent to the aircraft and crew. Initial witness statements are taken. The logistic plans for the field investigation and wreckage salvage begin to take shape – one of the board's most arduous tasks. When the wreckage is located, the board mobilizes and heads out – for the hills, the swamps, the woods, an irate citizen's backyard – to the crash site. The senior Board member's retinue will include an official photographer, any required security personnel, and medical personnel.

The first order of on-site business is to take excess photographs of everything. Then the remains are extracted and hastened to the nearest major military hospital for autopsy and pathology. Next comes location of the extremities of the wreckage pattern (including any unaccounted for crew/passengers), and the wreckage diagrams. Somewhere in here we should insert the arrival of the Safety Center investigator. They often arrive after the remains are removed, because their travel distance may be much farther than the Board's. However, believe that they have seen their share of *what's left* and have experienced all those *first glimpse* emotions more than

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once. They no longer have any curiosity about how a pilot looks after being strained through the instrument panel.

Don't forget that the area must be secured against intrusions of the idly curious and souvenir hunters, civilian and military. (Yes, folks, there are whackos out there who think it's really neat, or macho, to have an item of personal equipment from a dead aviator or one of those interesting little cockpit gages.) The *curious* are no benefit to a mishap investigation; they can do great harm by destruction or removal of evidence.

There is another crash-associated problem that may or may not require special attention from the Board – **rumor control**. At about this point, the *sea daddies* and *old salts,* not to mention some *young salts,* have it solved. They have seen this and that before, which obviously resulted in the other and caused the crash. It's not their idle resolutions at the crash site that hurt; it's when they take their unfounded theories back for discussion in squadron spaces. Although they rarely affect the Board's conclusions, uncontrolled rumors are very detrimental to unit cohesiveness, particularly to the morale and motivations of the aircrew, not to mention damaging effects they can have upon reaching the dependents of any lost shipmates. The Board must make every effort to keep *crash site gossip* at the crash site.

After the wreckage is located and plotted, it must be salvaged. The salvage operations range from loading an intact airplane (somewhat spindled and bent) onto a large truck, to picking up a 30,000-pound airplane 1 ounce at a time, placing it in gunny sacks, and lifting the scraps out of a remote site by helicopter. From the crash site, the wreckage is taken to a suitable hangar or hard surface area for layout. During layout, the wreckage is sorted and reassembled (a loose interpretation of the word) into the correct parts relationship. After thorough study of the damage patterns, certain parts are selected for in-depth EIs (Engineering Investigations).

The EIs are accomplished at the CFA (Cognizant Field Activity) for the selected aircraft component, which is normally a NARF (Naval Air Rework Facility) or a civilian contractor. When all the analyses and investigations are complete, the Board finalizes their collective thoughts about the causes and the prevention of similar mishaps into the *Summary Report of the Aircraft Mishap Board Conclusions and Recommendations.*

Each phase of the investigation is accomplished through attention to infinite details. The Board continually deliberates, examines each new piece of evidence, discusses possible accident scenarios, proves and disproves, probes and questions. The Safety Center investigator is intimately involved with each detail and deliberation while conducting his *concurrent* investigation.

The investigator utilizes methods and procedures proven through years of investigative experience. Although an individual investigator may be new in terms of the number of accidents he has personally investigated, he is backed by an impressive wealth of community experience. The investigators presently assigned to the Naval Safety Center have accumulated a total of 170 (plus) separate investigations. Even in the field, any one investigator has access to that wealth of experience. The investigator on-site maintains daily contact with the investigator at the Safety Center who is assigned as the Aircraft Accident Investigation Division coordinator, or "Month-in."

The "Month-in" has ready access to computer-stored data on all naval aircraft accidents, incidents, and malfunctions since 1953, as well as accurate records on all accidents investigated by the Safety Center. He coordinates many of the ancillary details of salvage efforts and ongoing engineering investigations. He also answers numerous phone calls from the Fleet.

Still, experience notwithstanding, there is something new to be learned on each investigation. Each investigator possesses an insatiable curiosity. Uncounted questions will be raised and answered and raised again, until every reasonable possibility has been explored, discussed, and concluded upon. Each experience, old and new, makes naval aviation a little bit safer.

There is no attempt to match the investigator's previous flight experience with the type of crash he investigates. Each individual takes his turn at being the next to go, or "Number One," irrespective of location or aircraft type. Methodology is the key and it far outweighs the need for having firsthand flight experience *in type.*

When there are no survivors or witnesses, the real cause must be determined by eliminating all the other possible causes. Were the engines producing enough power to sustain flight? Were the hydraulics working? Were the generators on the line, flight controls functional, evidence of emergency procedures accomplished, etc.? The investigator looks at everything, searching for anomalies – things that don't fit normal flight – a valve out of position, contaminated filters, attached parts that should be damaged but are not, FOD, etc. When a part, subsequently the system, shows no evidence of preimpact malfunction, then it must be concluded that it was operating correctly and did not contribute to the accident.

No criticism intended – hopefully none taken – but most Board members are susceptible to channelized attention or tunnel vision; they lock on to the first evidence that looks like a possible cause. They immediately build a plausible scenario around that evidence, at least in their minds, and then try to prove only that scenario, often discounting real evidence that fails to support their theory. The remainder of the investigation becomes a perfunctory performance without the needed inquisitive motivation.

Let's say, for example, the remains of a medium-sized bird were found in the cockpit area of the wreckage of an unexplained low-level, ground impact crash *(it did happen).* Someone thought aloud – "bird strike and incapacitated pilot" – and suddenly the accident was solved. Wisely, the Board soon talked themselves out of the tunnel vision mode and completed a good investigation. Subsequent analysis, after the field investigation was completed, revealed the bird had no broken bones nor had the pilot's windshield been penetrated prior to impact. That bird could have been a severe detriment to a less adept Board.

The Safety Center investigators are less susceptible to premature speculations before the facts, not because they are less human (although it's been suggested), but due to training and experience. This fact alone enhances their contribution to any investigation.

The field investigation is much more than inquisition by proven methodology, it's a logistic nightmare of people, equipment, and manual labor – a lot of plain, hard work. The salvage work is hard, hot, wet, cold, dirty, exhaustive, and frustrating, but necessary. Dress for the environment, not in a uniform, because it's important to be warm and dry so you can concentrate on the investigation. Even Sherlock Holmes would change hats for some of the inhospitable crash sites you may face. Teamwork is the key, and every man shares in the investigation and in the work – commander, seaman, and investigator alike.

The Safety Center aircraft accident investigator is sent to represent the Naval Safety Center and the CNO, and to assist the Board in the conduct of a complete investigation. He **is not** a spy. He **does not** make all the decisions. He **does not** make all the suggestions. He **does not** have all the good ideas. He **does not** write the Summary Message for the Board, but he **is** ready to share his ideas on all these matters. He and the Board may not agree on every conclusion, which is not a requirement. He **is** ready to listen to any good ideas. He **is** there to help. He **is** there to work as long and as hard as required to find the cause. He and the Board have the same goal: to find the cause in order to prevent similar mishaps. The bottom line is safety – **naval aviation safety.** ◄

The myth of the accident prone

The evening was pleasant and the old pendulum clock in the hallway beat out a steady and soothing rhythm. Joe was relaxing in his favorite chair, slowly sipping a cup of coffee. He was reflecting on what the past week had been like, and he was darn glad that it was over. The entire week had been one misadventure after another. He had almost run over little Jimmy, the neighbor's 5 year old, because he hadn't checked to see if the sidewalk was clear before backing out of the driveway. On three different occasions he'd made unsafe lane changes on the freeway that would have been disastrous if the other drivers hadn't been alert. It was absolutely his own fault and he knew it.

There had been several other small instances during the week, but the one today had really brought it home. He could hardly believe that it had happened. He had nearly 4000 hours under his belt and he'd come in with the wheels in the well. If the watch hadn't been doing his job, he could have been killed. His talk with the skipper that afternoon hadn't been all that much fun either. Was the skipper right? Was he accident prone?

By LT Lawrence H. Frank, MSC
COMNAVAIRPAC Staff

HOW often have you heard the cause of an accident attributed to *accident proneness* on the part of the individual involved? *Accident proneness* is a convenient label, but it's not a cause. The term *accident proneness* is a misnomer, a myth. By calling someone accident prone, you are stating that he was born to have accidents, that his hereditary nature makes him a klutz, and that there is nothing that can be done to stop him from having an accident.

This is just plain balderdash. Geneticists haven't discovered any *accident proneness* genes, and research studies have shown that we can't even predict a person's likelihood of having an accident from his past accident history. But accidents can be prevented, as will shortly be pointed out.

If *accident proneness* is a myth, why do some people appear to have more than their share of accidents? To answer this question let us first examine the reasons why a single accident occurs.

In almost every accident, the accident investigator is faced with a myriad of contributory variables. Very rarely is there a single, cut-and-dry cause factor. There are almost always numerous contributory variables, such as poor man-machine interface, supervisory error, limited experience, failure to use accepted procedures, task oversaturation, overconfidence, etc. Sometimes these variables are transitory and stress related. For example, the accident victim may have been suffering from some temporary physiological variable such as fatigue, anoxia, hypoglycemia, or a temporary psychological variable such as boredom, anxiety, frustration, or depression. Environmental variables such as weather also play an important role. Often, if one or more of these variables hadn't been present, the individual's performance may not have been compromised enough to result in a human-error accident.

Although there are several reasons why a person could be involved in an accident, is there a common denominator among these various reasons? Some early psychological research is suggestive. A few years ago a Navy flight surgeon/psychiatrist developed a psychological profile of the high-accident-risk aviator (he actually used the term accident prone, but we now know that this term is inappropriate). However, when you compare this theoretical profile of the high-accident-risk aviator to the psychological profile of the outstanding aviator, you make a very interesting discovery. Namely, the profile of the outstanding aviator and the high-accident-risk aviator have much in common, with the exception of one very significant factor. The high-accident-risk aviator appears to be undergoing stress, whereas the outstanding pilot is not. Does this suggest to you that an outstanding aviator undergoing stress is, in actuality, a high-accident-risk aviator?

This doesn't mean that all human-error accidents are caused by stress. What it does suggest, however, is that if stress is present, and if the quantity and/or severity is great enough, an individual – any individual – will be more likely to be involved in an accident. This individual shouldn't be considered accident prone, but rather one who has currently entered a high-accident-risk category. And everyone at some point in time enters this category. If you alleviate the stress, you reenter the low-accident-risk category where, incidentally, the majority of us are most of the time.

What exactly is stress? Stress is simply a normal "reaction of the body to the ordinary and extraordinary pressures of life." The presence of stress initiates hormonal and various other physiological changes, and can cause a drastic impairment in a person's cognitive and motor functioning. Remember Joe and his problems? What if you knew that Joe had been undergoing severe stress during the weeks prior to his numerous mishaps? His father, with whom he had a very close relationship, had recently undergone arterial bypass surgery. Joe's daughter, in asserting her independence, moved out of Joe's house, against his wishes, and into an apartment. Joe stopped smoking 2 weeks ago and has taken a second mortgage on his home. All these events are stressful. In light of what has been discussed, is it surprising that Joe has had a few close calls? When the stress diminishes, Joe will reenter the low-accident-risk category and be his old self again.

Prevention of stress-related accidents is a two-step process. First, you must learn to recognize that you are undergoing stress, and second, you must take action to reduce the stress affecting you.

Recognition of stress is really not all that difficult, since there are usually accompanying behavioral changes with increased stress. The following are common reactions to stress: anxiety, preoccupation, impatience, humorlessness, inability to concentrate, restlessness, frequent or prolonged headaches, unhappiness, depression, frustration, aggression, irritability, defiance, insomnia, and apathy or indecisiveness. A person undergoing stress will exhibit some but not all of these symptoms. The key is that the stressed person is behaving atypically. **He is just not himself.**

Continued

Reduction of stress in most cases is relatively easy, and can be handled in one of several ways. Physical exercise is an outstanding method of stress reduction. Whether it is intense, such as playing racquetball, or less strenuous, such as walking, it works well. Hobbies and other nonathletic events that you enjoy and derive pleasure from, such as reading, building model planes, needlepointing, or playing backgammon, are also excellent stress reducers. Your medical officer can provide you with specific "how to" information on relaxation therapies such as tensing and relaxing various muscle groups, or meditative techniques, which are easy, effective, require no special equipment, and can be performed by anyone. Additionally, don't sell your wife or good buddy short. Talking your problems out with someone whose opinion you value, or with someone who will just listen patiently, may be the best stress reducer around. If the stress you are encountering is so intense that these methods provide little relief, don't be afraid to seek professional help. It may save your life.

In summary, remember that everyone (wife, pilot, crew chief) enters the high-accident-risk category at some time or another. Entrance into this category is often preceded by a buildup of stress caused most frequently by the everyday variables that upset the normal routine of life. Consequently, when stress is present, increased awareness and caution are required. When you see the telltale behavioral changes taking place in yourself or someone else, take the necessary steps to reduce the stress and get back to being a low-accident risk. And, above all, remember the myth of the accident prone. ◄

Would you like one of your photographs on the cover of this magazine?

APPROACH Magazine is looking for high quality, color photographs for use on the cover. Glossy 8 x 10 prints or original slides are most desirable. The photograph should be of exceptionally high technical quality and, preferably, in vertical format. Uniqueness is one of the key criteria (i.e., we are not looking for typical photos of a single aircraft in a hazy, blue sky).

Send your submission directly to: Editor – APPROACH, NAVSAFECEN (Code 72), NAS Norfolk, VA 23511. Originals will be returned.

Watch your ice!

A P-3 crew was tooling along a southern airway at FL200, en route to an airport to pick up some aircrewmen. Suddenly, the aircraft swerved for no apparent reason. The auto trim showed full right rudder, so retrim was initiated, but there was no response.

The PPC disengaged the autopilot and violent swerves in both directions were encountered. The PPC quickly brought the swerves under control with the rudder. However, he felt and saw that the rudder pedals were oscillating one quarter throw left and right. The pilot put pressure on both pedals and rudder trim was again applied. This time a breakaway feeling was noticed from the trim control.

Oscillations ceased and the aircraft flew normally for 30 minutes. The PPC decided to reengage the autopilot, and random movement of the rudders continued. The autopilot was disengaged, but even more pronounced oscillations reappeared. **Boost out** was selected and the oscillations decreased to infrequent intervals.

Southside Center was contacted, and a clearance to a nearby NAS was requested. Center was advised of the P-3's flight control problems. During descent, **boost in** was selected for better rudder control. An uneventful approach and landing ensued.

Troubleshooters found no discrepancies in any part of the system, but ice was found on various parts of the empennage. The aircraft had been flying in icing conditions and it is suspected that ice formed on the rudder and rudder trim surfaces, causing the oscillations. The ice was removed, and the crew took off and completed the flight without any further directional control problems. ◄

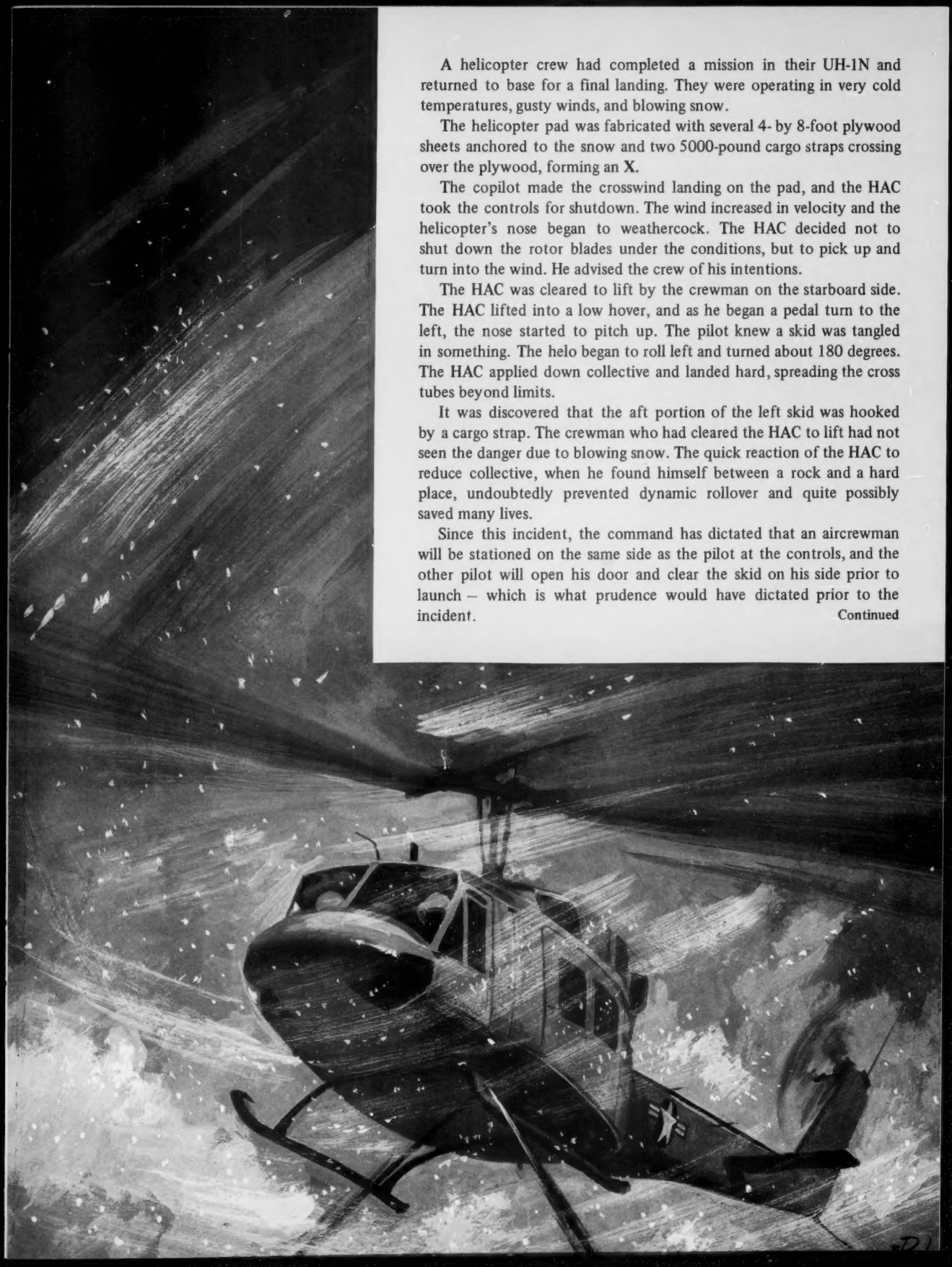
Winter glitches & gotchas

A C-1 crew was cruising along an airway at 12,000 feet. Mountainous terrain required that they fly at 9000 or above. The crew was in solid IMC with moderate ice accumulation. The pilot had turned on pitot heat, and carburetor air was on full alternate to try to maintain 25°C.

Center cleared the C-1 to descend to 10,000 feet, and as they descended, both pilots noticed the airspeed beginning to bleed off. Wing de-ice had to be turned on, but in a few seconds, it was secured. Prop de-ice was on fast. However, the airspeed indicator continued to decrease until it read zero. The alternate static source was selected with no change on the gages.

The copilot was about to declare an emergency and was trying to contact Center when the airspeed indicator came back to normal. The crew was nearing their destination and they were able to execute an instrument approach and make an uneventful landing. No one could explain why the airspeed indicator bled down to zero, but it was suspected that hail or heavy rime ice clogged the pitot tube faster than the heater could melt it.

An important point on this flight was that the forecast called for scattered thunderstorms with moderate to heavy rime ice in the clouds and possible hail.



A helicopter crew had completed a mission in their UH-1N and returned to base for a final landing. They were operating in very cold temperatures, gusty winds, and blowing snow.

The helicopter pad was fabricated with several 4- by 8-foot plywood sheets anchored to the snow and two 5000-pound cargo straps crossing over the plywood, forming an **X**.

The copilot made the crosswind landing on the pad, and the HAC took the controls for shutdown. The wind increased in velocity and the helicopter's nose began to weathercock. The HAC decided not to shut down the rotor blades under the conditions, but to pick up and turn into the wind. He advised the crew of his intentions.

The HAC was cleared to lift by the crewman on the starboard side. The HAC lifted into a low hover, and as he began a pedal turn to the left, the nose started to pitch up. The pilot knew a skid was tangled in something. The helo began to roll left and turned about 180 degrees. The HAC applied down collective and landed hard, spreading the cross tubes beyond limits.

It was discovered that the aft portion of the left skid was hooked by a cargo strap. The crewman who had cleared the HAC to lift had not seen the danger due to blowing snow. The quick reaction of the HAC to reduce collective, when he found himself between a rock and a hard place, undoubtedly prevented dynamic rollover and quite possibly saved many lives.

Since this incident, the command has dictated that an aircrewman will be stationed on the same side as the pilot at the controls, and the other pilot will open his door and clear the skid on his side prior to launch – which is what prudence would have dictated prior to the incident.

Continued

It was a dark, cold night and freezing precipitation was falling when the turboprop eased into a parking spot and shut down. The flight did not terminate at an air station where facilities are in abundance. Rather, it was a civilian airport with few facilities. It was necessary for the crew to discharge their passengers and refuel before proceeding to Homeplate.

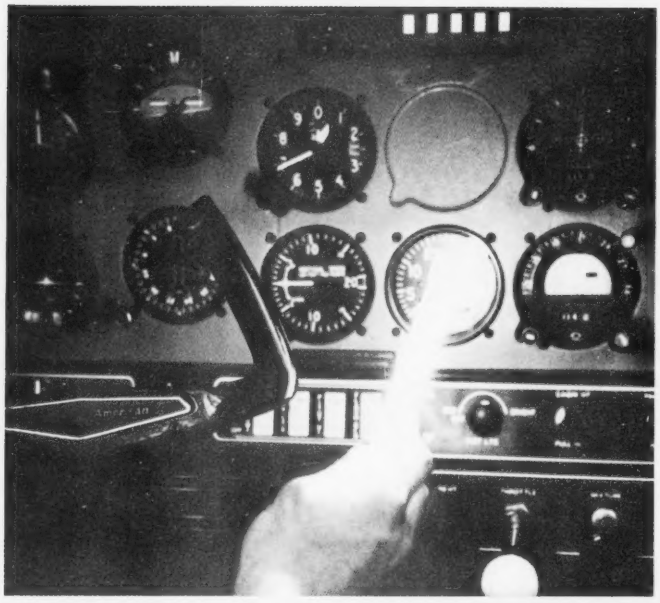
A workstand was moved into position beneath the main door to help crewmembers climb out of the aircraft. The flight engineer climbed out of the aircraft to supervise the refueling, started down the workstand, but remembered he had forgotten his flashlight. He turned around and reentered the aircraft. Moments later he returned to the cabin door, opened it, and started down.

The night was pitch black and wet, and there was no ramp illumination. Someone had removed the workstand, and the flight engineer fell to the ramp. He wasn't killed, but he was knocked unconscious, suffering a dislocated shoulder, three dislocated vertebrae, two broken ribs, and numerous other contusions and lacerations. He was rushed to a nearby hospital, and was subsequently discharged after a 5-day stay.

A lineman, without so much as "Mother, may I" or "Kiss my foot," had removed the workstand because he thought it was nearly time for the aircraft to depart. Obviously, there had been no communication between him and any of the crew.

This time of year all sorts of personnel and aircraft dings are directly related to cold, discomfort, ice, hail, and snow. It is essential for all maintenance crews and flightcrews to review cold weather technique, and take the time to do their jobs properly. ◄

Cyalume Lightstick



Photos courtesy CYANAMID, Chemical Light Department

THE *Cyalume* lightstick is not new to many Navy users, but instead of open purchase, it is now available through normal supply channels.

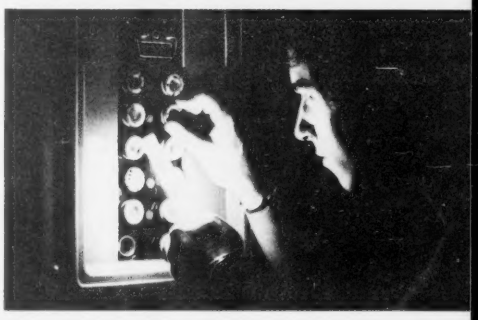
The *Cyalume* lightstick is a chemical light (chemiluminescence) which converts the energy in a chemical reaction into light. There is no heat or flames, no batteries, or sparks. In fact, it is cold and cannot cause fire or explosion. It is safe to use in areas which contain combustible gas mixtures, in magazines, during refueling operations, and a myriad of other places.

Once the lightstick is energized, it cannot be shut off. It will glow until depleted. However, the chemical reaction can be slowed by placing the lightstick in a freezer. Upon removal from the freezer, room temperature will permit the light emission to continue.

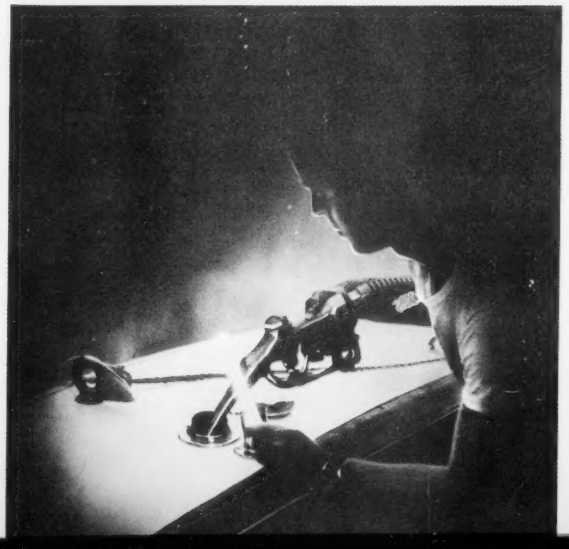
The lightstick emissions respond to changes in temperature. Normal light emission is best between 70°-80°F. Should the temperature be higher than 80°F, the light will be brighter, but for a shorter period. The converse applies in cold temperatures; it will be less bright, but will last longer.

At present there are three different sizes of lightsticks. There is a 4-inch, general purpose wand (NSN 6260-00-106-7478). There are also 6-inch lightsticks good for either 30 minutes or 12 hours. The 30-minute lightstick identification is NSN 6260-01-074-4230, and the 12-hour lightstick identification is NSN 6260-01-074-4229.

The shelf life of the *Cyalume* lightstick is 4 years. It will float, and can be used under water. If a lightstick should be punctured, the chemicals will stain clothing, but the mixture is nontoxic and can be rinsed away with water. If the chemicals come into contact with the skin or eyes, the area should be thoroughly flushed with water.



The illustrations in this article show a few of the uses of the *Cyalume* lightstick – a real handy and safe tool.



MISSED APPROACH

"If the runway is not in sight at published min

PILOTS and NFOs hear these words of instruction almost daily. Seldom, though, do they have to execute them. When they do, pandemonium sometimes follows, as it did in the case of two F-4s that returned to MCAS West, following a routine training hop. The instructions, "If field not in sight at published minimums, climb straight ahead to TACAN, then turn left (complete within 3 nm) and intercept R-180 outbound, maintain 4000 feet," really taught the fledgling crews (and the *experienced* in the chain of command) a lesson about flight planning and executing a missed approach. These two nearly *Fuelless Fantoms* came within 1000 ± pounds of ending up as *Desert Rats!*

The crew of *Phantom-1* consisted of a first tour pilot and a second tour RIO. The weather for the flight was predicted to be marginal at best, yet above minimums. The main instrument runway was closed for resurfacing, but the parallel was available for operations. However, a "side-step" radar approach necessitated raising the PAR minimums from 200-½ to 300-1. The crew had been briefed to depart the operating area with bingo fuel set at 4500 pounds, shoot a radar approach to an arrested landing on the northwest left runway, or divert to their alternate, Desert AFB, some 60 nm to the north. No sweat, everyone *thought.*

The updated weather at MCAS was received as 500 overcast, 1-3 miles in rain. The decision was made to execute the approach. *Phantom-1* started down the "chute" and was picked up by the final controller who, in turn, relayed the missed approach instructions. The crew "rogered" and informed the controller that, in the event of a missed approach, an *immediate* clearance *direct* to Desert AFB would be required.

At "MINS," no runway was in sight! The F-4 pilot executed his instructions to the "T" and reiterated his request for vectors *direct* to Desert. Four minutes later, on his assigned radial (180) and altitude (4000 in VMC), the concerned crew declared an *emergency* and once again reiterated their request for *direct* vectors! Another 2 minutes went by before the crew decided to turn towards their alternate, clearance or not. By this time they were approximately 75 miles from their alternate! Center, at this time, was finally able to grant clearance to Desert AFB at FL230 (by this time they were already level at 230).

Forty miles from Desert, *Phantom-1* commenced its idle descent with 1600 pounds of precious JP-5 onboard. The crew were set up for a straight-in approach to the northeast runway, and finally touched down with only 600 pounds left! Two sighs of relief were interrupted by two gasps as the F-4 came to an unexpected halt in the BAK-12 arresting gear, 1400 feet from the end of the runway. You guessed it . . . they forgot to raise the hook when executing the missed approach at MCAS West! They were extracted from the gear and returned to the line without further incident.

Enter *Phantom-2* into the picture, which had the same makeup and scenario as his playmate, except he ended up sucking even more fumes! The pilot came down the "chute," and upon reaching "MINS," saw no airfield.

inimums, execute missed approach procedures."

Executing missed approach as directed, this crew continued on assigned heading and altitude for 8-10 minutes before declaring an *emergency* and heading for Desert AFB. Center assigned the aircraft an altitude of 13,000 feet, and after an intermediate climb to FL190, FL230 was assigned. Forty miles from their alternate, with 800 pounds onboard, the fast-becoming-fuelless F-4 commenced its descent to the northeast runway at Desert. Despite his pleas for a straight-in, the approach controllers tried to get the pilot to make a couple of turns, but fortunately, he ignored them. Touchdown was with 250 pounds of fuel remaining! The crew of *Phantom-2* joined the crew of *Phantom-1* on the desert ramp only 5 minutes apart. Safe, but a bit shaky.

One may ask, "How did these flights get into such a predicament in the first place?" After very detailed and extensive analysis that hopefully will prevent future occurrences of this nature, the following information shed some light on this incident:

- *Supervisory* – Launching aircraft into marginal weather with insufficient fuel requirements to complete the entire mission, execute an approach to Homeplate, and divert to an alternate with the fuel required by existing unit SOPs. (The unit SOPs required 2000 pounds more than OPNAV reserve. Furthermore, even if they had this extra 2000 pounds of fuel, it wasn't enough to complete the syllabus requirement. It was later determined that the hop should have been cancelled in the first place!)
- *Aircrew* – Failure to inform controlling agencies, in a timely manner, of minimum fuel and of the impending, and later, actual emergency.
- *Air Traffic Control* – Inability of controlling agencies (due to conflicting traffic, minimal alert notice, necessary sector coordination, and high workload) to expeditiously clear the aircraft as requested, once the aircrews declared emergencies.
- *Environmental* – Weather in the approach corridor to the northwest runway at MCAS West was probably worse than that existing over the field.

The tale of the two *Phantoms* should be a lesson to those that rely too heavily on the "system." With the largest percentage of flights departing and arriving under positive control these days, aircrews often tend to disregard or overlook their own navaids and/or prior training techniques, and put total trust in the controllers. It's nice to rely on the controller for assistance, but remember, they too have their limitations and restrictions. For the pilot, there is no one else who knows his capabilities and limitations any better than the pilot himself. Know yours, for the bottom line still reads... It's the pilot's responsibility.

In case the readers are wondering... Yes, Phantom-2 did remember to raise his hook after missed approach, and made a normal rollout at his alternate. –Ed. ◄

THE NEW FOUR-LINE RELEASE SYSTEM

By LCDR H. T. Pheeny, MSC
Naval Weapons Center
China Lake, CA

THE four-line release system (Aircrew Systems Change 383) is now on the street! What is it? How does it work? What are the benefits for naval aircrew personnel?

It is the mark of a professional that he recognize and minimize the hazards of his job. Naval aviators are no exception. One of these hazards is the bailout or ejection scenario. Statistically, the odds are overwhelmingly in your favor that you'll never have to undergo an emergency exit from your aircraft. But if it does happen, your survivability is enhanced if you use the NATOPS procedures established for your aircraft. One optional step in these procedures is the activation of the four-line release system incorporated in your personal parachute.

The four-line system is now being installed on designated parachute assemblies that employ the 28-foot flat circular canopy. By pulling down on the right- and left-hand release *lanyard pull loops* (located on the two rear risers), the four rear suspension lines are released, allowing a lobe to form at the rear of the parachute canopy.

A lobe is formed at the rear of the parachute canopy following four-line release.

What are the advantages of the four-line release system? The four-line release modification will:

- Reduce the incidence of parachute landing injuries by eliminating the oscillations inherent in flat circular parachutes.
- Allow improved directional control and maneuverability.
- Provide a forward velocity of 3 to 4 knots in still air.
- Reduce the potential of aircrew entanglement with the raft/survival kit and parachute suspension lines after water entry.

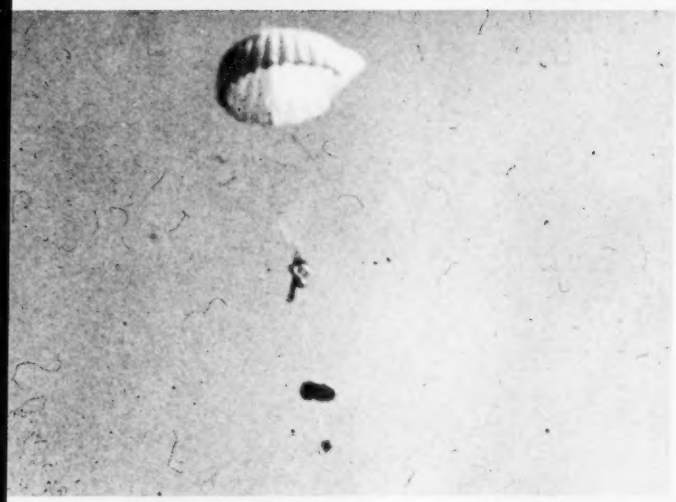
A review of past records of ejections and bailouts indicates that the largest number of nonfatal parachute injuries occur during the parachute landing fall. Not only are you, the aircrewmember, unable to pick your landing site, but you are also subject to oscillations. Oscillations are a pendulum-like swing primarily caused by the uneven escape of air from under the flat circular canopy. They are often induced by variations in wind shear and are both unpredictable and undesirable. Oscillations induce nauseousness that can degrade your chance of survival as well as cause serious injuries during parachute landing.

So, now you have made the decision to eject/bail out and have acted upon that decision. You're suspended under your canopy and have completed the initial NATOPS post-escape checklist (i.e., inflate life preserver; deploy rigid seat survival kit; if ejection was from high altitude and several thousand feet remain, raise visor and remove oxygen mask). Now you are ready to decide if you should use the four-line release. First, check your parachute. If there is any canopy damage or if there are broken or tangled suspension lines, the four-line release system should *not* be used. If the parachute is undamaged, locate the *pull loops* on the inside surface of the rear risers. These *pull loops* are located approximately 26-28 inches above the Koch canopy release fittings and are attached by a "daisy chain" coupling to the four rear suspension lines at the connector links. To activate the four-line release, pull down on both *pull loops* (it's a 12-inch pull requiring approximately 20 pounds of force).

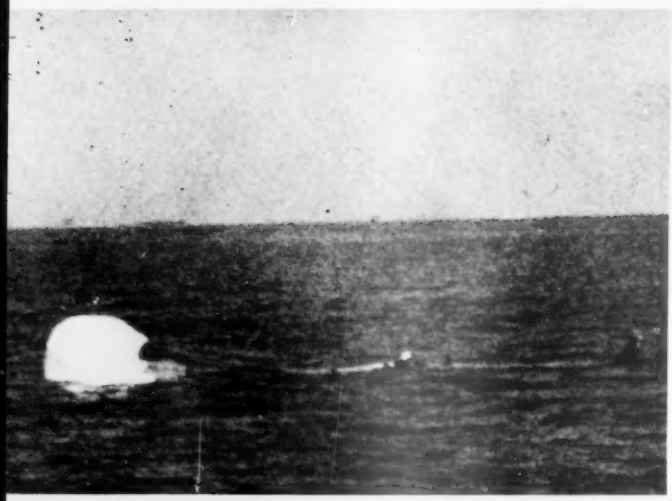
When the four lines are released, a lobe is formed at the rear center of the canopy. The lobe acts as an exhaust flute, and as air is expelled from the canopy, a forward velocity of about three to four knots develops. In this configuration, canopy stability during descent is markedly improved as oscillations are effectively dampened.

You can also use the *pull loops* to obtain improved directional control and maneuverability. By pulling down

Four-line release system is activated by pulling down on both release lanyard pull loops.



After completing the postescape checklist and activating four-line release, the aircrewman turns into the wind for water landing.



By turning into the wind prior to water landing, the aircrewman is downwind of his raft and survival kit and upwind of his parachute and risers.

on the left *lanyard pull loop,* the canopy will turn left; pulling on the right turns the canopy right. A 360-degree circle can be navigated in approximately 20 seconds and less than 800 feet of descent altitude. In essence, the four-line release modification gives your parachute a gliding effect, plus some maneuverability. Given sufficient altitude, you can now use the directional control capability to choose a more favorable landing site. It is recommended that you use the *lanyard pull loops* to turn into the wind prior to landing.

The four-line release system can be used at any altitude. However, if you are unsure of your altitude or are 200 feet AGL or below, you should prepare for landing by completing the NATOPS prescribed procedures rather than trying to use the four-line release system. If the four-line release is not employed, the aerodynamic performance of the parachute is the same as that of an unmodified parachute.

Over water, the four-line release provides an additional advantage. Tests done at El Centro have shown that the forward velocity imparted to the parachute by activating the four-line release causes the deployed liferaft and survival equipment to trail you during your descent. Therefore, upon water entry, your liferaft and survival equipment enter the water first, you enter downwind, and finally, the parachute enters the water even further downwind. This spatial separation of your liferaft, yourself, and your parachute significantly reduces the chances of entanglement of these three entities with one another after water entry. You can, upon water entry, concentrate on releasing your Koch canopy release fittings.

In summary, the four-line release system provides you with a method to reduce the incidence of nausea and landing injuries by eliminating parachute oscillations during descent. Further, maneuverability is provided which can be used for selecting more desirable landing sites and for counteracting the effects of surface winds by the use of forward velocity to turn the canopy into the wind. The hazard of parachute entanglement after water entry is thus greatly lessened.

Aviation Physiology Training Units and designated Aviation Medical Safety Officer (AMSO) teams have received a training film (NM13170) and slide/lecture kit on the four-line release system. If you desire to use these for an AOM or other training, contact your local Aviation Physiologist. ◄

Bibliography

[1] George Menard, *Personnel Parachute Four-line Release System.* (NAVAERORECFAC Technical Report 9-74, December 1974 AD BOO5618L).

[2] Aircrew System Change No. 383, *Personnel Parachutes; Installation Instructions for the Four-Line Release System* (1 March 1979).

[3] NAVAIR 13-1-6.2, *Aviation Crew Systems Manual.*

CREW COORDINATION

AN SH-3G was hovering at 6 feet in a drone recovery configuration with the copilot at the controls. The recovery crewman was stationed on the lower step of the personnel door, attempting to hook the lanyard of the drone. That day the ocean was reasonably quiet. The sea state was 3 and winds were 11 knots.

After maintaining a hover for about 3 minutes, the pilot saw a 40-degree rise in T_5 on both engines. Just as the HAC was going to initiate the command to terminate the recovery, a loud bang was heard, No. 1 torque fell to zero, and the rotor RPM began to decay.

The HAC and copilot simultaneously applied full power. The crewman on the door jettisoned the recovery hook, and the safety observer pulled him inside and closed the personnel door. The *Sea King* settled gently into the water. The copilot lowered collective to regain N_r and applied 50 percent torque to maintain aircraft stability on the water, while the HAC secured the No. 1 engine. The copilot began a water takeoff.

The helicopter was given an aircraft integrity check and the crewman reported that a large volume of water had entered through the open sonar hole. Fuel dump was not initiated due to the immediate water takeoff. The No. 2 engine was above topping limits, with the manual throttle full forward.

The copilot began to taxi and pulled the helo into the air on the backside of a wave. The taxi run was only about 20 yards. As the helo became airborne, N_r decreased to 94 percent and No. 2 engine T_5 was 720 degrees (85 percent torque). Forward flight was established as N_r decayed, but held at 80 percent. The copilot maintained a level attitude as the *Sea King* accelerated slowly, not far above the waves. The copilot didn't lower the nose, to keep the aircraft from plowing nose-low into the waves.

The crew felt at least two skips of the tail, after takeoff, and water came pouring in the sonar hole, up to the overhead, and forward. Both pilots were soaked, as was the radio console between them.

The airspeed slowly rose to 35 knots and the copilot began small cyclic flares to increase N_r and altitude. Finally, when the N_r had increased to 92 percent, a 50 fpm climb was established. The HAC turned the IFF to emergency and tried to use the UHF and the PRC-90 (without success) to tell someone about their problems.

The helicopter began climbing at 70 knots, and the pilots initiated fuel dump while cruising at 1000 feet. Communications were eventually established with Homeplate about 25 miles out. An emergency was declared, and the helicopter was flown to Homeplate and landed single-engine, without further complications.

Both pilots were fully qualified, and the coordination which they displayed is what this business is all about. The actions by the crewman getting ready to hook the drone and the safety observer demonstrate that they knew their stuff. No material was available to seal the sonar hole, and the action by the copilot to get airborne as quickly as possible was exemplary. (With the engine performance degradation due to salt encrustation, and the amount of water being taken on, it is highly unlikely the helicopter would have made it had there been a delay.)

APPROACH awards a big Attaboy to LT L. V. Graves, LT D. V. Stoddard, and their crew. ◄

Anymouse

Time for One More

IT was the monsoon season – at dusk. We returned to our ship following a combined overwater/overland VFR navigation flight.

All gages were green and we had about an hour of fuel remaining in our trusty H-2. When overhead, our ship's ASAC advised, "You have a green deck and there is a storm 7 miles ahead." The HAC decided we'd make one touch-and-go before final landing.

The touch-and-go was no sweat. We made an ITO since darkness had descended upon us. We flew a standard, night DLQ pattern and lined up on final at 1¼ miles with an amber "ball" from the stabilized glide slope indicator. At three-fourths of a mile we were enveloped by rain, gusts, and lightning. Our ship literally disappeared!

At three-eighths of a mile on the TACAN, we realized we were about 250 feet above glide slope (given our standard gouge of 200 feet at one-half mile and 125 feet at one-quarter mile). The ship and SGSI still weren't in sight. The HAC tried a quick descent to get back on glide slope. We waved off at 80 feet and exited the storm.

Overtaken by the psychological phenomena of get-it-back-on-deck, we elected to attempt an emergency, low visibility approach with ASAC control. While being vectored onto final, we reentered the storm. All of a sudden, the turn needle and ball pegged and the compass spun!

Although spinning the wrong way, we guessed we had the ultimate helicopter emergency, a loss of tail rotor thrust. After spinning for what seemed to be an eternity, we regained tail rotor authority. By radar indications, our *Seasprite* had visited a waterspout! Both of us in the cockpit were severely disoriented, but we managed to keep a straight course as the collective was glued to the HAC's armpit. About this time, our ever-reliable 30-minute fuel light illuminated.

We got our heads together and declared an emergency. The ship reversed course and went flank speed to clear the storm. Ten minutes into our remaining fuel, we turned 090 degrees and headed for a friendly shore 16 miles away.

Yes, we made it to the beach and spent the night listening to the breakers. What did I learn? Most importantly, with limited fuel, don't plan a touch-and-go with bad weather imminent and, as a helo pilot, any nonhostile, flat, and clear area to bingo deserves planning and use!

Never-do-it-againmouse

A Near Fiasco

AN AV-8A, configured with 300-gallon fuel tanks (9200 pounds total), launched from Davis-Monthan AFB just after sunset (it was totally dark) for a return night leg to Yuma. The following discrepancies tended to orient pilot thinking to possible fuel transfer problems:

- On preflight, a slight leak was noted from standpipes on the left droptank, which could preclude airborne tank transfer.
- The starboard transfer light on the warning light panel was flickering

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

REPORT AN INCIDENT
PREVENT AN ACCIDENT

in flight, which could indicate reduced pressure in the starboard fuel system, and could prevent fuel transfer on the right side. In the AV-8A, if the right or left TRANS light comes on, the respective fuel gage drops to 300 pounds of fuel. If the light is flickering, the fuel gage will very slowly drop to 300 pounds.

- At high altitudes, the 300-gallon tanks have been known not to transfer. (It hasn't happened to me, but I've heard of incidents with other pilots.)

After leveloff at FL270, I noticed that I had to trim right wing down. I also noticed that the right fuel gage was slowly dropping, but I attributed this to normal operation as the TRANS light was flickering and the gage should slowly drop to 300 pounds.

In the next 2-3 minutes, I realized that the problem was more than a transfer problem. I was excessively applying right wing down trim. I was 57 miles east of Phoenix and still about 180 miles from Yuma, so I requested flight direct Phoenix, direct Yuma, and also requested a lower altitude (FL230 to remain VFR above clouds). When I finally realized I was losing fuel, I thought the filler cap for the right tank had come off. The last thing I checked was the fuel jettison switch, because I never turned it on. But when I looked at it, it was full forward – *dump on!* I had jettisoned 2900 pounds of starboard fuel, and I now had 1300 pounds right, and about 3500 pounds left.

When I examined the dump switch, I found the stops worn flat. Instead of having to lift the switch over the stop and pushing it forward, only a very slight force was required to push it forward. I must have knocked it forward while writing a new Center frequency on my kneeboard. One other possibility exists. In order to read a SID or approach plate at night, the pilot must place it above his knee and forward near the instrument panel. I could have hit the switch while moving the SID forward to read it.

The important points are:

- I was predisposed to expect fuel transfer problems and did not question the fuel reading because I had often seen it before.
- I didn't check the fuel dump because I never turned it on. I suspected every other possibility but the actual cause.

I balanced fuel using the fuel flow proportioner and boost pumps and landed uneventfully at MCAS Yuma.

Fooledmouse

Stupidity

AFTER a recent squadron change of command, all guests gathered around the cake and coffee table for small talk. Suddenly, a sailor from another squadron started to open the hangar doors.

When the doors were opened far enough, in came a tow tractor pulling a helicopter. All the children thought this was the neatest trick they had ever seen. They immediately began dancing all around the "train," while the tow tractor driver continued traveling toward the desired parking spot. There was no stopping the surge of little feet and waving hands.

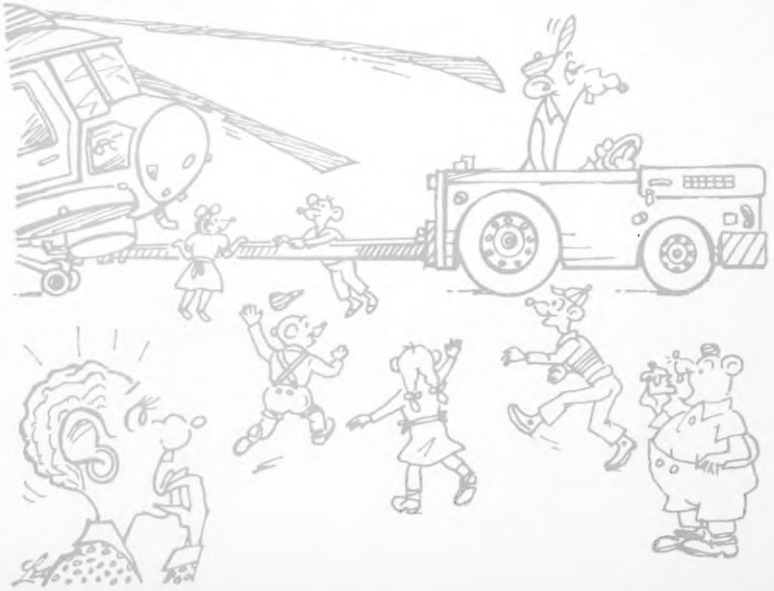
A frantic call was made to the other squadron's maintenance department, to stop the operation. The circus halted after the helo had been nestled safely into its berthing spot. Things returned to normal.

Ten minutes later, the same sailor walked out of the hangar, and the whole crazy cycle was repeated. The tractor reappeared, towing another helicopter. The only difference this time was that parents quickly kept (read: chased) their children away.

The second incident brought a rather rapid visit of "heavies" to the other squadron's maintenance office for a little one-on-one dialogue (except there were three or four heavies talking at once to one maintainer).

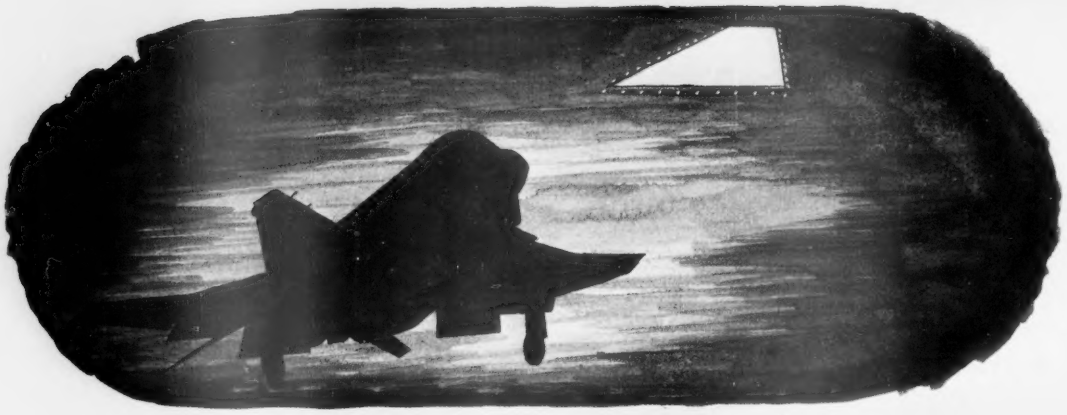
The finale of the afternoon's incidents concerned the same sailor, who opened the hangar doors once more, proceeded outside, then reached back and closed the doors *from the outside* until the rubber cushions touched his arm, and then yanked his arm quickly outside the doors.

Lividmouse



"Rock River 100, your signal-bingo. Clean up, hook up. Divert "A" bears 240 at 60 nm."
It began as a normal . . .

NIGHT BINGO



By LT John A. Conkey
VF-161

FINALLY, my heart rate began to slow as we executed the procedures covered in the brief and started a normal night bingo profile. Up to this point, nothing else about the hop had been normal. My first "black" catapult shot in 5 weeks left me fighting a case of vertigo that only abated somewhat as I looked at the pitching deck from three-fourths of a mile. After two bolters, a few attempts at the A-7 recovery tanker, and a waveoff, we were on our way to Divert "A," along with six other aircraft from the air wing. Climbing on bingo profile, I had settled down enough to ponder my last three passes, thinking the flight was about over.

A corollary to Murphy's Law, that I learned from past experience, started to make its presence known – "Just when everything is going well, you can expect something to go wrong." It started subtly enough. The TACAN at Divert "A" (the only divert field within 1500 nm) was down. My RIO was able to paint the divert island, so we passed the real *pigeons* back to the ship. (The initial vector was 30 degrees off and 20 miles long.) Then the radar dropped off the line. No problem; the field was in sight at 20 miles. Upon contacting Tower, we were informed that we were talking to a radio watch rather than an air traffic controller. About that time, the pucker factor rose sharply, as the island was engulfed in darkness following a total power failure. My instinctive reaction was to key the UHF and broadcast, "All right, turn on the damn lights!" This "normal" night bingo had assumed the proportions of a major emergency.

Fortunately, the power failure was only a few minutes long, and the lights came back on long enough for three low-state *Phantoms,* two *Corsairs,* and an *Intruder* to land. However, it could have been disastrous if we had launched a cycle later, as the island again plunged into total darkness for approximately 2 hours.

A few lessons were learned from this experience:

- Ensure that you are ready for a divert. This includes briefing the divert field in such a way as to leave no doubt about how you are going to get your aircraft safely on deck after that last look at the boat. Briefing items should include best known bearing/distance, direction of approach, NAVAIDs available, arresting gear, type approach to be flown whether IMC, VMC, NORDO, lost NAVAIDs, etc.
- Check your landing lights periodically on the carrier; you never know when you may need them.
- Plan ahead for the eventuality that either your system is not 100 percent up or the divert field's system is not 100 percent up.
- Play the "what if" game so that you are prepared for anything. If you planned for everything that could go wrong, you will end up flying a bingo profile and divert procedure that you have prebriefed.

BRAVO ZULU

LT Bob Browne
LTJG Rick Price

"RAPIDLY diminishing options" has been the theme of many a readyroom hair-raising sea story. Such was the case recently when the crew of an A-6E *Intruder* was confronted with drastically reduced maneuverability and emergency fuel. The end result was a safe recovery aboard the USS AMERICA (CV 66).

LT Bob Browne and LTJG Rick Price of VA-95, the pilot and bombardier/navigator team of NH 510, had worked their way down from the Case I overhead stack and into the landing pattern after a routine training mission. The weather was good, with only slightly reduced visibility due to haze; temperature 83°F; and wind 23-25 knots down the angled deck. Despite a good setup, the aircraft boltered, having hook-skipped both three and four wires. The sustained rate of climb after the bolter was only 300 feet per minute, with full power and speedbrakes retracted. After checking the engine instruments for full power indications, the crew visually confirmed the speedbrakes retracted, but discovered the flaperon pop-ups (spoilers) were fully deployed, even though the system was not armed.

The aircrew continued their climb as they followed NATOPS procedures for a flaperon pop-up emergency in flight. Additionally, they attempted to troubleshoot the malfunction.

All efforts to secure the flaperon pop-ups, including inducing a total electric failure, were unsuccessful. Lateral control stick authority was restricted to 1 inch either side of the neutral position, but the aircraft was controllable using coordinated stick and rudder.

With fuel becoming critical, the crew cleaned up the aircraft, jettisoned external stores, and climbed to rendezvous with the duty tanker overhead at 8000 feet. Airborne refueling with the A-7 tanker, configured with a D 704 buddy store on a port wing station, proved to be impossible due to the restricted lateral control and the tanker's jet blast over the starboard wing.

With a fuel state of only 1500 pounds, and a fuel flow of over 10,000 pounds per hour, options had rapidly decreased. Tanking was impossible and a bingo was out of the question.

Realizing their situation, the aircrew descended and requested an immediate straight-in approach. The *Intruder* was transitioned to the landing configuration 2 miles astern. With a marginal waveoff capability and only 1000 pounds of fuel remaining, the crew recovered safely aboard.

LT Browne and LTJG Price demonstrated superior performance in airmanship, saving a valuable Fleet aircraft from being lost at sea. The aircrew displayed the professionalism and skill that ranks them high among naval aviators. A hearty well done.

Left to right: LTJG Rick Price, LT Bob Browne

Passenger Safety

WHEN flying as a passenger aboard any transport aircraft, be it commercial or military, the crew is bound by regulations to brief passengers on applicable safety equipment. Some of the items that are covered are the use of oxygen masks, seat position, lifevests/rafts, exits, and seatbelts! Misuse or nonuse of any safety item could lead to serious injury of any nonabiding or uninformed passenger (or crewmember, for that matter). One thing for sure, a thorough understanding of all safety features is a must, for the mishap *ogre* is waiting around the corner. He was there and claimed another victim on the COD flight from USS GALAXY to NAS Broken Neck.

The C-1A had just finished refresher landings aboard the GALAXY and was in the process of switching pilots and loading passengers for a trip to the beach. The switch and the load were completed, and the *Trader* was given a one-third flap cat shot off the bow. On the stroke of the cat, one of the five passengers was "ejected" from the last seat (port side, facing aft) because of not being properly strapped in! He impacted the rear of the cabin, received a broken neck, and was paralyzed from the chest down. None of the other passengers or crew received any injury in this mishap.

How did it happen and why? Simply laid to *haste* and *misunderstanding.* It started out as a routine trip from the beach for some CQ practice and a return to the beach. After the ninth landing the tower notified the COD that he would be loaded (pax and cargo) and bingoed to the beach. The C-1 was in a position such that the holdback was in place and the nosewheel was over the shuttle. Usually, the port engine is secured when preparing to load passengers, but this time it was left running. The copilot, not qualified to fly passengers off the ship, had to deplane. He left his left seat position and exited the aircraft. The pilot-in-command got out of the right seat and strapped into the left seat while awaiting his copilot, passengers, and cargo.

The copilot and the ATO (Air Transfer Officer), waiting

in flight deck control, were surprised when they saw the COD taxi past the island and onto the cat. Thinking that it was still in the CQ pattern, they continued to wait. Finally realizing this was not the case, they and five passengers hurriedly headed for the awaiting aircraft, on the cat. Although the passengers were issued cranial helmets, **they received no safety brief for the upcoming flight!** The copilot entered the cockpit, strapped into the right seat, and received *his* brief from the PIC: "Checklist complete, if your harness is locked." (This is a common practice during CQ evolutions when pilots switch seats. However, this part of the flight was not a continuation of CQ, but instead, a logistics hop to the beach – and the checklist was **not** complete!)

The plane captain was in the process of securing 250 pounds of cargo when the passengers arrived. While he was tieing down the cargo, the unbriefed passengers tried to secure themselves in their seats. About that time, a director gave the "thumbs up" signal to the pilot, indicating they were ready – outside. The pilot returned the signal with a "thumbs down," indicating that they were not ready inside. The PIC looked aft and saw the crewman trying to assist the passengers in strapping in. The crewman wanted to ensure that *all* were ready to go. He thought he heard the words, "Hurry up!", but shook his head in the negative. They weren't ready. Not all, including himself, were strapped in. Before the crewman could get strapped in and plugged into the ICS, he felt the COD go into tension and to full power! He braced himself against the seat in front of him. The stroke of the cat was on the way and so was one of the passengers, who was totally unfamiliar with the shoulder/lapbelt restraint mechanism of the C-1. The results, you've already read – major injury. All this because of a breakdown in communications and an unneeded sense of urgency by the aircraft's and ship's crew.

Total elapsed time from the COD's last trap till cat launch was less than 10 minutes. From pax/cargo load till launch it was less than 5! Hardly enough time to **safely** change crews, load cargo and passengers, and properly brief all concerned. Several violations of NATOPS procedures occurred in this situation.

To name a few:

- No brief by the ATO and aircrew.
- Port engine not secured for loading passengers.
- Aircraft taxied past the shuttle before the pilot could verify the gross weight.
- Flightcrews did not use challenge and reply method of completing checklists.
- Lack of common sense and judgment.

The entire evolution did not allow sufficient time for the crew to safely complete what they had to do. There was no state of urgency, even though some may have perceived one. There was a state of confusion as far as communication went, however. Hand signals and voice signals were misinterpreted/misunderstood. This mishap could have been more disastrous. What if the cargo and the other passengers weren't strapped in? (Re: "Cargo Load Shift," APPROACH MAR '79). Total disaster! Had proper compliance with *all* checklists by the plane commander, air transfer officer, and aircrew/plane captain been followed as prescribed, the whole incident could have been averted. Next time, and each and every time, ensure – "All passengers are properly briefed and secured with seatbelt and shoulder harness" – prior to launch. ◄

The Enemy

I AM more powerful than the combined armies of the world. I have destroyed more men than all the wars of all nations. I massacre thousands of people every year. I am more deadly than bullets, and I have wrecked more homes than the mightiest guns.

In the United States alone, I steal over 500 million dollars each year. I spare no one, and I find my victims among the rich and poor alike, the young and old, the strong and weak. Widows know me to their everlasting sorrow. I loom up in such proportions that I cast my shadow over every field of labor.

I lurk in unseen places and do most of my work silently. You are warned against me, yet, you heed me not. I am relentless, merciless, and cruel. I am everywhere – in the home, on the streets, in the factory, at railroad crossings, on land, in the air, and on the sea.

I bring sickness, degradation, and death, yet few seek me out to destroy me. I crush, I maim, I will give you nothing and rob you of all you have.

I am your worst enemy – I am CARELESSNESS.

Author Unknown

DROWSY

AN A-4 pilot had departed Homeplate for a cross-country to the opposite coast. While on his RO2N, he picked up a heavy cold. The night before his return, he hit the sack early and slept for about 4 hours. He awakened, took a cold capsule, and went back to sleep for another hour. After only 5 hours sleep, he arose, took two antihistamines, and proceeded to base operations.

At Ops he filed a stopover flight plan to Homeplate, with two fuel stops along the way. He took off about 0200, and the first leg, a little over 2 hours, was uneventful. After filling up, he launched on the second leg, about 2½ hours. On final approach he had a little problem with an ear block. He borrowed a set of wheels from a friend, ran a quick errand or two, and then took off on his final leg an hour later. His third takeoff was normal, and he climbed to 17,000 feet.

The pilot leveled off, removed his oxygen mask, and secured the flow of oxygen. Cabin pressure was 8000 feet. The AFCS was on altitude and heading hold, and he set the throttle at 3500 pounds per hour fuel flow. About 30 minutes out he developed UHF difficulties, but eventually was able to contact base radio and report that he would be on the deck in 20 minutes. That is the last thing the pilot remembered for 45 minutes.

A half-hour after the pilot made his report, the SDO was called by Base Ops saying Center had reported that they had a NORDO target which had zipped by Homeplate and was out over the ocean – opening! A few minutes later, the sleepy pilot's position was 100 miles off the coast. The SDO requested that interceptors be scrambled, and two F-106s were soon launched.

Fifteen minutes later, the pilot woke up, saw nothing but water, and turned to a reciprocal heading back toward land. He was disgusted that he had no TACAN lock on, and even more disgusted when he couldn't contact Center. His fuel quantity was only 1200 pounds. Not knowing his distance from land, he reset power and began a climb to 20,000 feet. He also went on oxygen.

A few minutes later, he got a momentary lock on at 150 miles and also made voice contact with GCI. He was switched to Center frequency and learned that the F-106s were only 40 miles from him. They joined up in the next 10 minutes.

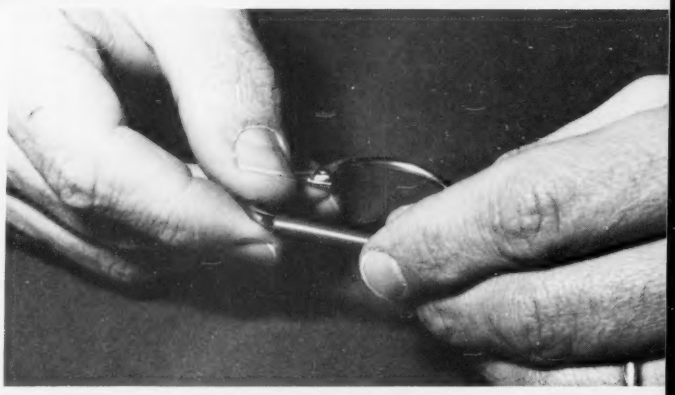
A vector was discussed to Homeplate. The aircraft were at 20,000 feet and the A-4 pilot had 100 miles to go and 1000 pounds of fuel to get him there. The A-4 pilot, by then, was wide awake and the pucker factor was off the gage. However, things looked brighter when he hit 45 miles to go and had 500 pounds of fuel. The fuel transfer light began to flicker. At 26 miles to go, he had 400 pounds and began an idle descent. A few minutes later, he was 9 miles from the approach end of the runway and subsequently made a routine landing. The 106s broke off and headed back to their base.

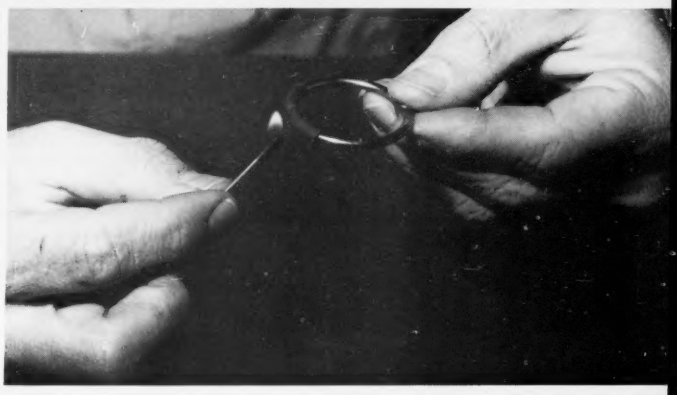
After shutdown, fuel was measured at 390 pounds. The pilot was met by more interested people than a VIP would expect. He was all shook up and was taken to the dispensary to determine whether the loss of consciousness was due to hypoxia or some other physiological problem. He was not hypoxic. The oxygen system checked OK, and the pressurization system checked the same.

In the flying game there are lots of "no-nos" – self-medication is one, insufficient sleep is another, and removing an oxygen mask in flight is a third. It's a wonder the pilot lived. (It later came to light that the same pilot had previously taken a snooze while airborne, but that time he had another aviator with him to wake him up.)

It takes very little imagination to realize what might have happened if he had lost pressurization or the AFCS, or if he had been above an undercast. ◄

Reducing cockpit FOD





THERE is a continuing problem with the loose metal rings on standard NATOPS Pocket Checklists becoming cockpit FOD. This is especially true in two-seat cockpits where checklists are used routinely. With monotonous regularity, a ring will fall off the pocket checklist into the cockpit decking and get lost among cables and pulleys for control surfaces. This requires downing the aircraft until the ring is found.

The OinC of Air Test & Evaluation Squadron FIVE, Det Whidbey, proposed putting standard electrical shrink tubing around the latches of each metal ring and sealing them shut with heat. This does not impair turning pages in the checklist and will prevent further aircraft downing incidents due to lost rings. If a NATOPS Pocket Checklist change is issued, the shrink tubing can easily be cut off and replaced. The photos show how it's done.

APPROACH awards CDR T. J. Williams an Attaboy for this simple but effective idea.

LETTERS
to the editor

Re: "Port Side Plane Guard – A Better Way?"

NAS North Island – Your recent article (NOV '79) on search and rescue operations was interesting to say the least.

It should be noted, however, that the Navy does have dedicated plane guard helicopter detachments operating in the Fleet.

Helicopter Combat Support Squadron ONE, based at NAS North Island, holds the primary mission of Fleet SAR and presently has detachments based aboard USS MIDWAY, USS CORAL SEA, and USS BLUE RIDGE.

LT C. M. Rohda

Do We Really Learn?

NAS North Island – In a peacetime Navy, safety is a common topic in messages and in magazines. In today's environment of high prices for the training of pilots, for fuel, and for replacement parts, safety is even more paramount. Without being callous, the Navy cannot afford to lose any of its valuable manpower through an avoidable accident. The NOV '79 issue of *Naval Aviation News* has several articles on retention of pilots and the costs to train new pilots, plus the unrecoverable and immeasurable costs of the loss in experience level. This has always been the case, but is even more so now that the loss of one or two individuals must be prevented at any cost.

In particular, all aviators must do everything in their power to help prevent accidents, particularly to avoid repeating accidents for which the causes are known. Safety cannot be something to merely talk about, nor can the burden be placed on other shoulders to carry out the less popular tasks. A recent safety message said something to the effect that, "Perhaps it is time to start holding people accountable for their actions." Very appropriate, but the accountability must start at the top and not at the bottom.

An example might be taken from aircraft accidents in the H-46 community. In the summer of 1972, an H-46 was inadvertently flown into the water while night flying, causing minor damage to the aircraft. Fortunately, there were no injuries. During the spring of 1977, another accident occurred with more tragic results. An H-46 again flew into the water at night, but this time not everyone escaped. In both of these accidents, a recommendation was made to incorporate an improved low altitude warning system in the H-46.

In the fall of 1977, while the pilots were practicing VERTREP, probably the most demanding and hazardous flying for an H-46 pilot, the aircraft descended below a safe altitude and made contact with the water. Fortunately, no one was injured and the damage to the aircraft was repairable. Informal discussions with several other H-46 pilots indicate that others have had similar experiences, but the outcome was less serious – there was no damage to the aircraft. Regardless of the fault for not reporting these incidents, knowledge of them exists. The point is that this type of mishap is not unique and that there is a very serious need to prevent these accidents from recurring.

Although the last accident placed the primary causal factor on pilot error, several recommendations were made that would undoubtedly help prevent this type of accident in the future. In the JUL '78 issue of *Naval Aviation News*, Grampaw Pettibone criticized the pilots of the last accident for less than professional performance, yet said nothing about the lack of action on the recommendations made as a result of the accident, or about similar recommendations of some 5 years before.

What exactly were these recommendations? The primary one was for an improved low altitude warning system. Helicopters were designed for low altitude operations, and although every helo pilot is aware of the dangers of flying low, occasionally even the best aviators get distracted. Obviously, someone realized the need for such a warning system in other helicopters; the H-3 has one. Then why does the H-46 not have such a system? At present only a small light on the radar altimeter illuminates when the aircraft descends below a pilot-selected altitude. It should not be that difficult to alter an existing system to give the H-46 an aural signal, and possibly, a caution light when the aircraft is below a pilot-selected altitude. It will cost some money, but so does replacing pilots and aircraft. The question is whether we are really interested in giving pilots the safest aircraft we can to perform the assigned mission.

A second recommendation was to procure an H-46 flight trainer. With the decrease in flight-hours per pilot, and the lack of sufficient air-capable-ships to practice with, pilots are not able to maintain proficiency as high as they once were. The Marine Corps recently unveiled the first H-46 trainer at MCAS(H) New River, but it will be at least 2 years before the Navy receives its H-46 trainer.

It is not that H-46s are new to the helicopter community; quite the contrary. They have been providing support to the Fleet for over 10 years. Plus, the Navy will no doubt continue to task pilots to fly the H-46 in the future. Why then does it take so long for the H-46 aircraft to be retrofitted with equipment that most other helo communities have had for some time? LAMPS ships have glide slope indicators to assist in night approaches; H-2s and H-3s have flight trainers, low altitude warning systems, and coupler/doppler systems. What does the H-46 community have for night operations? – pilot ability.

Is the Navy really concerned about giving these pilots the safest aircraft? There is no doubt that the weak pilots or the occasional *flat hatter* must be weeded out. However, there are existing systems for doing this. Squadron COs are tasked with monitoring the performance and progress of each pilot assigned to their units. So what

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, VA 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

purpose does a *Monday morning quarterback* serve by criticizing pilots who make honest mistakes while trying to perform in a professional manner? What must be done is to make our aircraft as safe as possible for the assigned missions. Then perhaps our pilots will have the latitude to make a human error, that we know will be repeated sooner or later no matter how much training and lecturing is done, yet not have it result in an aircraft accident.

When the choice between preventing an accident is to eliminate human error or add a minor system to the aircraft, it would seem easier and more reliable to add a warning system. Must we have another H-46 fly into the water at night before someone will finally take action and authorize the needed changes? One must wonder how many other communities in the Navy have similar situations, where a minor equipment alteration would allow the unit to perform its mission in a safer environment.

By LT J. M. Haggerty
HC-11

Re: "Flying a Desk"

Austin, Texas – As an NFO (VQ-4/EC-130) serving as an NROTC instructor, I was greatly moved by the very poignant article by my former VT-29 squadronmate, LT Chris Panos, "Flying a Desk," in the NOV '79 issue.

I had been aboard the NROTC unit at the University of Texas only 6 months when it became my duty to drive to a nearby, small Texas town to inform the parents of a "nugget" pilot in a fighter FRS that their son's first night trap had cost him his life. It was even more arduous to present that neatly folded American flag to his young widow just moments after the playing of Taps and the fly-by of three TA-4s from NAS Kingsville (that required Sec Def approval). I felt all the emotions alluded to by LT Panos in his article. The difference is that in my case I learned that the young pilot and his NFO ejected successfully after the crash/fire, but that only the NFO was able to survive after entering the sea. The pilot, despite all the training and survival equipment at his disposal, drowned.

The point becomes a question of WHY? And without answering the question, I submit that this case should cause all of us in aviation to give some really serious consideration to what the Dilbert Dunker and all the water survival training is designed to accomplish. What good is an ejection system and a wealth of NATOPS knowledge if the individual aviator subsequently drowns?

Execution of CACO duties may make one despondent, but it also forces you to seriously ask yourself, "Could I survive if I/we went down at sea?" That thought might add some credence to water survival requals and add a new dimension to crew ditching drills.

LT Vern Lochausen

DWEST Training for Squadron Maintenance Personnel

NAS North Island – An integral part of training for all Navy pilots and aircrewmen is DWEST (Deep Water Environmental Survival Training). In fact, flightcrews complete DWEST several times during their careers; a minimum of once every 5 years. Passengers in naval aircraft, however, normally receive only a rudimentary briefing to prepare them for an emergency involving the same deep water environment. This briefing emphasizes aircraft ditching procedures and, normally, not what to do once in the water.

As a member of one of HC-11's helicopter detachments embarked on non-aviation ships, enlisted personnel of this command are routinely transported long distances over open ocean. The typical detachment fly-away normally consists of a two-plane transit. However, the probability of rapid rescue in the event of ditching is nonetheless low, as both helos are usually fully loaded with passengers and equipment.

To increase the survivability of our personnel, HC-11 has instituted a program whereby training in deep water survival and rescue is provided to all detachment personnel prior to deployment. The key to this program has been the excellent support received from FASOTRAGRUPAC, NAS North Island, who has provided DWEST instructors and training facilities on a not to interfere basis with the formal DWEST courses. The training consists of in-the-water experience in deployment, inflation, and boarding of the LR-7 liferaft (carried in our aircraft), use of the raft's survival equipment, proper donning of the survivor rescue sling, and a live hoist pickup from the DWEST training tower.

Admittedly, this training does not cover all facets of deep water survival/rescue. But, considering the virtual lack of any other program available to maintenance personnel, it is a positive step in the right direction. Aviation units that wish to institute such a program without the benefit of a local DWEST training facility can incorporate this training into their pre-deployment workup utilizing lectures and graphic demonstrations. If such training seems unnecessary, remember this – in 1 year alone, HC-11 transported more than 15,000 passengers. It is estimated that over 80 percent of our passenger flights were in the open sea environment!

LT Frank Benkert
HC-11 Ground Safety

• Squadrons routinely carrying maintenance personnel as passengers over water, but not fortunate enough to be located near a formal DWEST site, could set up a water survival training program at their local pool. Second best is a clear, concise brief on aircraft egress *and* survival equipment use. ◄

When Calling NAVSAFECEN

For those of you in the field who have a need for contacting specific personnel at the Naval Safety Center, the following listing should prove beneficial:

	AUTO 690-
Director, Aviation Safety Programs	1123
Aircraft Operations and Facilities Division	3666
• Aircraft Analysts	3381
Maintenance and Material Division	3494
Aircraft Accident Investigation Division	3321
Aeromedical Division	7341
Submarine Safety Programs	1140
Surface Ship Safety Programs	1565
• Surface Ship Analysts	1561
OSHA Programs	3345
Safety Publications Department	1321
Safety Education and Training Department	4005

NO LIGHTS

LIEUTENANT Evan Wenger of VA-25 was No. 2 in a section of A-7Es assigned as flare/reattack aircraft in a two-section, night, War-at-Sea exercise. The flare and reattack tactics brief called for LT Wenger and his flight lead to split and attack in a timed sequence from different directions.

During pullout from the bombing run, LT Wenger's master generator dropped off the line. He extended the EPP in accordance with NATOPS and attempted unsuccessfully to reset the generator. Separated from his leader, and hampered by a weak radio, LT Wenger broadcast his intentions and decided to proceed directly to NAS Fallon for an immediate landing.

Overhead NAS Fallon, *the EPP failed,* leaving LT Wenger without any electrical power. After the loss of EPP, the airplane experienced severe roll and yaw inputs to the right. With only his flashlight for cockpit lighting, and only pressure instruments for reference on this dark night, LT Wenger lowered his landing gear and circled the initial.

He saw another A-7 and attempted a rendezvous to get a positive gear check. The joinup was unsuccessful as the other pilot did not see LT Wenger. LT Wenger flew a straight-in approach, using approximately one-half left rudder and one-half left stick to maintain wings level. A successful arrested landing followed.

LT Wenger's total professionalism, demonstrated by his thorough knowledge of NATOPS procedures, his cool, level-headedness under stress, and his adept flying skill, made a potentially disastrous situation look like a routine play. Attaboy! ◄

☆U.S. GOVERNMENT PRINTING OFFICE: 1980—635-048/20

Standardization

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Attitude

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Familiarity

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Experience

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Technique

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YOU

...make it all add up in your favor!

Naval Safety Center
NAS Norfolk, Virginia

Poster idea contributed by AT2 Mike Mansfield, VP-92

Would you let this man ride in your non-ejection seat aircraft?

YOU BETTER NOT!

His LPA contains the FLU-8/P Automatic Inflation Device [see warning label in photo] and could trap him in the aircraft in the event of a ditch.